

## Determinants of Farm and Non-Farm Family-Controlled Child Labor

Kofi Acheampong, Western Michigan University

### Abstract

Ninety five percent of the child labor in Africa takes place in private households where children are controlled by their relatives. While this is a major problem, the literature provides little discussion on the determinants of this form of child labor. To fill this gap, I examine the determinants of farm and non-farm family-controlled child labor using data from the 2009 Ghana Time Use Survey. The findings indicate that school networks, the education level of the head of household, and religion play important roles in determining children's activities in both farm and non-farm work.

Keywords: *Family-controlled, child labor, logit*

### Introduction

This paper examines the determinants of farm and non-farm family-controlled child labor using the 2009 Ghana Time Use Survey. According to the United States Department of Labor, Sub-Saharan Africa made moderate advances to eliminate child labor in 2012.<sup>1</sup> While this is a laudable achievement, estimates from the International Labor Organization (ILO) indicate that the region still has the highest incidence of children's involvement in economic activity and lags behind other regions in the elimination of child labor. Poverty is widely provided as the reason for child labor's predominance in Africa. This is known in the literature as the "luxury axiom" (Basu & Van, 1998). Basu and Van (1998) provide a theoretical model to support their claim that low incomes force children into the labor market. The authors show that the market for child labor is characterized by binary equilibriums: one in which adult wages are low and children work, and the other in which adult wages are high and children do not work.

This paper focuses on family-controlled child labor, or situations in which children's labor is monitored and controlled by the children's close relatives including grandparents (Anvig 2001). This paper does not examine situations in which children's labor is controlled by their biological parents. The existence of family-controlled child labor has significant policy implications, because programs targeted towards eliminating child labor depend on understanding the causes of child labor. Therefore, it is important that we determine the causes of child labor so that appropriate policies can be directed towards eliminating the problem. I use the 2009 Ghana Time Use Survey to examine the determinants of farm and non-farm family-controlled child labor. Like many countries in Africa, Ghana has the most strenuous and dangerous forms of family-controlled child

---

<sup>1</sup>According to the United States Department of Labor, a country made moderate advances in eliminating child labor if it made recommended initiatives and revisions in laws and regulations, coordination and enforcement, policies, and social programs to eliminate child labor.

labor (ILO, IPEC, 2003, 2012). Children are engaged in agriculture, fishing, and hazardous industries like mining and quarrying. The child labor law in Ghana conforms to international standards. The minimum age for employment is 15 years and applies to both the formal and informal sector. The law also prevents children younger than 18 years from engaging in hazardous activities.<sup>2</sup> I define child labor using responses to the following survey questions: 1. Did you do any work for pay, profit, family gain, or did you produce anything for barter or home use during the last 14 days? 2. Did you work for more than 20 hours per week, including domestic work?

I contribute to the literature by examining the determinants of child labor with a focus on family-controlled child labor. I first ran a pooled logit regression and included a dummy for children involved in farm activities. The results from the pooled regression show that the dummy variable for farm labor is positive and significant. Therefore, children involved in farming are more likely to be involved in child labor than those who are not involved in farming. I proceed to run separate regressions to examine the determinants of farm and non-farm child labor. I find that household wealth has a negative impact on farm child labor, which indicates that farm child labor is sensitive to changes in household wealth. The results also show that household wealth has no impact on non-farm family-controlled child labor. The findings also indicate that school networks, education level of the head of household, and religion play important roles in determining children's activities in both farm and non-farm work.

## **Literature Review**

Studies on child labor are based on household models in which household utility and income constraints determine the decisions of household members ((Basu, & Van 1998; Bonnet, 1993). These models show that the allocation of children's time is based on variables that include: child characteristics, parent characteristics, family composition, poverty, school characteristics, and region or location of household. The dataset used in this study provides information on the aforementioned variables, which helps to ensure that important causal factors are included in the regression and eliminates potential for bias. I summarize below the various characteristics that impact children's labor.

### **Child Characteristics**

Child characteristics include age, gender, and birth order. It is well established in the literature that child labor increases with age (Ray, 2000; Bhalotra and Heady, 2003). Although the results vary depending on the type of data as well as the definition of what constitutes child labor, the assumption is that older children are more productive and able to perform difficult tasks. The fact that child labor increases with age implies that earlier-born siblings are more likely to enter the labor market than later-born siblings. This notion is consistent with the literature on birth order effects. For example, when Emerson and Souza (2007) examined the impact of birth order on child

---

<sup>2</sup> The Children's Act deems workplaces in mines, quarries, at sea, or in venues that expose children to immoral behavior as hazardous to children's health.

labor, they found that male and female first-borns are less likely to attend school and more likely to be involved in the labor market than their later-born siblings. The literature here reviewed provides mixed results on the impact of gender on child labor.

### **Poverty**

As noted in the introduction, poverty is usually regarded as the main cause of child labor, particularly in developing economies. Basu and Van (1998) provide a theoretical model of the child labor market that supports this notion. The authors find that the market for child labor is characterized by two equilibriums, one in which adult wages are low and children work, and the other in which adult wages are high and children do not work. A number of studies have provided empirical evidence to support this theory. For example, Dehejia and Gatti (2002) use a macro-level dataset from the ILO to show that the GDP per capita is negatively associated with child labor. Ray (2000) uses a micro-level dataset to provide empirical results that support the theoretical model by Basu and Van (1998). Patrinos, & Psacharopoulos, (1997) use data from Peru and Pakistan to test the hypothesized relationship between child labor and poverty, and their results indicate a positive relationship between child labor and poverty. However, some studies have provided empirical evidence that contradicts the positive relationship between poverty and child labor. Bhalotra and Heady (2003) challenge the idea that child labor takes place in poor households. The authors use survey data from Pakistan and Ghana to show that children in land-rich households are more likely to work than children from land-poor households.

### **Parent Characteristics**

Parent characteristics, which include education and marital status of the parent or head of household, also impact the determinants of child labor. It is widely accepted in the literature that lack or low education of the head of household has a negative relationship with child labor (Dehejia and Gatti, 2002; Patrinos, & Psacharopoulos, 1997). Educated parents are more likely to send children to school full-time than send them into the labor market. Patrinos, Lopez-Calva, and Bando (2005) demonstrate that the probability that a child will go to school increases with education level of the household head. Their results also indicate that the probability of the child's involvement in child labor decreases as the education level of the household head increases. The authors also found that the probability that a child will go to school rather than enter the labor market increases when the household head is married.

### **School Characteristics**

School characteristics include proximity to school as well as quality of the education system. According to Bonnet (1993), poor low school quality and low returns to schooling in many African countries partially explain why some parents consider work to be a better option for their children than school. In many rural areas in Africa, schools are located far away from communities and many children have to walk long distances to go to school. Parents, concerned about the safety of their children, are thus forced to take their children with them to the farms or send them to work

at closer locations. Although it is widely accepted that proximity to school can affect child labor, there is little empirical evidence to support this claim. For example, Kondylis and Manacorda (2010) show that improved proximity to school increases school attendance. However, the authors found that improved proximity to school has no impact on child labor.

### **Household Size**

Household size refers to the number of dependents in the household. The literature provides evidence that the higher the number of dependents in the household, the higher the probability of a child working. Psacharopoulos (1997) examines the impact that the number of siblings and activities of siblings have on schooling and child labor. The author finds that there is a positive effect between the number of siblings and the probability of involvement in the labor market. Canagarajah and Coulombe (1998) also find that families' area of residence and religious affiliation impact the determinants of child labor.

### **Data**

I use the 2009 Ghana Time Use Survey to examine the determinants of farm and non-farm family-controlled child labor. The survey is the first time use survey conducted by the Ghana Statistical Service in collaboration with the United Nations Commission for Africa. The survey consists of 4800 households and 10,742 individuals selected from a representative sample of both urban and rural areas. It provides information on the time spent by children and adults on all paid and unpaid activities. The survey also provides comprehensive information on household assets, expenditures, demographic characteristics, and households' use of social services including schools. I focus on family-controlled child labor, excluding children who are the biological offspring of the head of household or are otherwise related to the head of household. I have constructed this sample using responses to the survey question, "What is your relationship to the head of household?" I also categorize the data between children who are involved in farm activities and children who are involved in non-farm activities. I define child labor as children between the ages of 10 and 15 who:

- Worked for a wage, salary, commission, or any payment in kind, including paid domestic work  
And or
- Worked for more than 20 hours per week, including domestic work

I obtained information on each child's age, gender, parent characteristics, school enrollment, proximity to school, and household assets (type of dwelling, number of rooms, whether or not there is electricity, type of water, and farmland ownership). The household assets used include: radio, bicycle, television, refrigerator, motorcycle, car, land, source of water, source of electricity, cooking fuel, and house. Because the survey does not provide information on household income, I constructed a wealth index variable to proxy for income. I follow Filmer and Pritchett (1998; 1999) and construct a wealth index using principal component analysis.

The final sample consists of 1,381 children. I present descriptive statistics in Tables 1 and 2. Table 1 indicates that, on average, 35% of boys are involved in child labor compared to 22% of girls. What is disheartening is the fact that the statistics also show that about 60% of the children involved in child labor are reported as part of the labor market or among those who received paid work. I also find that child labor is higher in farm locations compared to non-farm locations. On average, 61% of child labor occurs in farm locations compared to 39% in non-farm locations. I run a two-sample t-test for the difference in the average values and find that the difference is significant at the 1% level of significance.

Table 2 shows mean values for additional variables included in the model. Age is measured in years, with the average age of 12.8 years. I expect the coefficient for age to be positive as is consistent with the trend that households' are more likely to send older children to the labor market. Descriptive statistics show that the average household size is 4. I expect the coefficient on household size to be positive—the larger the family, the more mouths to feed, and therefore the more children who are required to work for income. In terms of schooling, 78% of children are enrolled in school. On average, children walk 1.8 miles to school. I expect the coefficient for school enrollment to be negative as children enrolled in school are less likely to be in the labor market. I expect the coefficient on distance to school to be positive. The further away schools are, the less likely it is that children will be enrolled in school and the more likely it is that they will be engaged in work. In general, a smaller proportion of children involved in both farm and non-farm child labor are enrolled in school. Approximately 57% of those in farm child labor are enrolled in school compared to 63% for non-farm child labor. The descriptive statistics also show that for farm child labor, 42% of household heads have primary education, whereas for non-farm child labor, 47% of household heads have primary education.

### **Empirical Methodology**

In this paper, I examine the determinants of farm and non-farm family-controlled child labor. I use the empirical specification in equation 1.

$$Y_i = B_0 + B_1X_i + e_i \quad (1)$$

$Y_i$  is a dummy variable where 1 represents family-controlled child labor and 0 represents otherwise.  $X_i$  is a vector of variables for gender, age of child, school enrollment, proximity to school, household size, education of the household head, religion, and household wealth. Religion is a dummy variable where 1 indicates households that are Catholic or Protestant and 0 represents otherwise. Because the dependent variable takes the value of 0 and 1, using OLS will produce results that do not make sense because there is nothing in this regression to bind our estimates between 0 and 1. Instead, I use a logit regression to estimate the model in equation 1 and report marginal effects.

### **Results of Regression**

I first ran a pooled logit regression and included a dummy for children involved in farm activities. In this dummy variable, 1 represents children involved in farming and 0 represents

otherwise. I report the results of this regression in Table 3. Unlike linear regression models, the estimated coefficients from a logit regression do not give us the marginal impact of the explanatory variable on the dependent variable. Therefore, the results in Tables 3 and 4 are marginal effects estimated at mean values. The marginal effects give us the changes in the probability of a child involved in child labor as a result of a change in the explanatory variables.

The results from the pooled regression show that the dummy variable for farm labor is positive and significant. Children who are involved in farming are more likely to be involved in child labor than those who are not involved in farming. I proceed to run separate regressions to examine the determinants of farm and non-farm child labor. The first column in Table 4 shows results for farm family-controlled child labor, and the second column shows results for non-farm family-controlled child labor.

### **Household Wealth**

The results show that the coefficient of household wealth has a negative and statistically significant impact on farm child labor. An increase in household wealth decreases the probability that a family-controlled child will be involved in farm labor by 2%. This result confirms the luxury axiom postulated by Basu and Van (1998). Most of the children involved in farm work live in rural communities where households have little or no capacity of ensuring themselves from economic volatility so children's involvement in work is essential to ensuring the survival of the household.

### **Child Characteristics/Household Size**

The results indicate that an increase in the child's age increases the probability that the child will be involved in farm work by 5.3%. I find that family-controlled boys are, on average, 18% more likely to be involved in farm labor than girls. This result supports the findings of Canagarajah and Coulombe (1998), which state that girls are more likely to be involved in unpaid domestic work, which may not be included in the formal definition of child labor. The findings are similar for non-farm family-controlled child labor.

In contrast to the findings by Psacharopoulos (1997), I find that an additional member of the household decreases the probability that a family-controlled child will be involved in farm work by 0.3%. For non-farm child labor, having an additional member in the family increases the probability a child will be involved in work by 4.8%. Although child characteristics are important determinants of farm and non-farm child labor, it is important to distinguish between part-time and full-time work. However, the dataset does not provide me with the necessary information to undertake this analysis.

### **School Enrollment/Distance to School**

I find that school enrollment has no impact on farm child labor. I constructed the variable school enrollment from responses to the survey question, "Is child currently in school?" Although children may be enrolled in school, certain conditions may prevent them from actually attending school, and the variable school enrollment does not capture school attendance.. Distance to school increases the probability that a family-controlled child will be involved in farm child labor by 4.2%.

Poor school networks, lack of textbooks, and lack of teachers may discourage schooling in rural communities. Similarly, the results show that distance to school increases the probability that a family-controlled child will be involved in non-farm child labor by 1.6%. I also integrated school enrollment with distance and the results indicate that the coefficient is negative and significant for both farm and non-farm labor. Children who are enrolled in school are less likely to be involved in both farm and non-farm child labor.

### **Parent Characteristics/Religious Affiliation**

Education level of the household head is statistically significant and has a negative impact for both farm and non-farm family-controlled child labor. As mentioned above, religion is a dummy variable where 1 represents households that are Catholic or Protestant and 0 represents otherwise. The results indicate that affiliation with a Catholic or Protestant religion decreases the probability that a family-controlled child will be involved in farm child labor by 1.8%. This can be explained by the fact that many higher quality primary schools are run by churches that provide educational support to households.

### **Conclusion**

In this essay, I use logistic regression to examine the determinants of farm and non-farm family-controlled child labor. I used the Ghana Time Use Survey data, which provides detailed information on time spent on paid and unpaid activities of both adults and children. The findings illuminate key differences between the determinants of farm and non-farm family-controlled child labor. I find that household wealth has a negative impact on farm child labor, which indicates that farm child labor is sensitive to changes in household wealth, while household wealth has no impact on non-farm family-controlled child labor. The results also indicate that, on average, older children are more likely to be involved in both farm and non-farm child labor than younger children. Therefore, government policies should be directed at reducing school dropout rates for older children. The findings also indicate that school networks play an important role in determining children's activities in both farm and non-farm work. The government should make budgetary allocations towards the construction of schools and school facilities to improve access to schools, particularly in rural communities where the majority of children are involved in farm child labor. The results also indicate that education of household head has a negative impact on both farm and non-farm family-controlled child labor. Policies should target the improvement of adult literacy rates and establish non-formal education programs to improve attitudes towards education, which will further improve the probability of children's engagement in schooling.

## References

- Andvig, Jens. C. (2001). Family-controlled child labor in Sub-Saharan Africa: A survey of research. *World Bank Social Protection Discussion Paper Series*.
- Basu, K., & Van, P. H. (1998). The economics of child labor. *American Economic Review*, 88(3), 412 – 427.
- Bhalotra, S., & Heady, C. (2003). Child farm labor: The wealth paradox. *World Bank Economic Review*, Oxford University Press, UK, 197 – 227.
- Bonnet, M. (1993). Child labor in Africa. *International Labor Review*, 132 (3), 371-389.
- Canagarajah, S., & Coulombe, H. (1998). Child labor and schooling in Ghana. Policy Research Working paper no. 1844. *The World Bank*.
- Dehejia, R. H., & Gatti, R. (2002). Child labor: The role of income variability and access to credit across countries. *Working Paper No. 9018, NBER*.
- Emerson, P., & Souza, P. (2007). Is child labor harmful? The impact of working earlier in life on adult earnings. *IZA Discussion Papers 3207, Institute for the Study of Labor*.
- Filmer, D. and L. Pritchett. (1998). Estimating wealth effects with- out expenditure data—or tears: With an application to educational enrollments in States of India. *World Bank Policy Research Working Paper 1994, Development Economics Research Group, World Bank, Washington, DC*.
- . 1999a. “The Effect of Household Wealth on Educational Attainment: Evidence From 35 Countries.” *Population and Development Review* 25(1):85–120.
- . 1999b. “Determinants of Education Enrollment in India: Child, Household, Village and State Effects.” *Journal of Educational Planning and Administration* 13(2):135–64.
- Kondylis, F., & Manacorda, M. (2010). School proximity and child labor, evidence from rural Tanzania. *CEP Discussion Paper, Centre for Economic Performance, LSE*.
- Patrinos, H., Lopez-Calva L. F., & Bando, R. (2005). Child labor, school attendance, and indigenous households: Evidence from Mexico. *Policy Research Working Paper Series* 3487, The World Bank.
- Patrinos, H., & Psacharopoulos, G. (1997). Family size, schooling and child labor in Peru: an empirical analysis. *Journal of Population Economics*, 10, 387-405.
- Ray, R.. (2000). Child labour, child schooling and their interaction with adult labor: Empirical evidence for Peru and Pakistan. *The World Bank Economic Review*, 14(2), 347 – 371.
- Roeske, J. (2003). Skills training strategies to combat worst forms child labour in the urban informal economy in Ghana. Retrieved from ILO, IPEC. INT/00/000/AAA[ILO\_REF]  
<http://www.ilo.org/ipeinfo/product/download.do?type=document&id=1140>
- United States Department of Labor. Report on Child labor. Retrieved from:  
<http://www.dol.gov/ilab/reports/child-labor/advancement.htm>



## Appendices

Table 1

*Data Summary*

BOYS			GIRLS	
FREQ	PERC.		FREQ	PERC
<b>Child labor</b>	457	35%	237	22%
<b>Non-child labor</b>	848	65%	838	78%

Table 2

*Variable means*

Variable	Farm	Non-farm
<b>Age</b>	12.6	13.2
<b>Household Size</b>	4	3
<b>School enrollment</b>	57%	63%
<b>Distance to school</b>	1.9	1.6
<b>Education for head of household</b>	42%	47%

Table 3

*Pooled Logit regression. Dependent variable is child labor.*

<b>Marginal effects</b>	<b>Dependent variable: Child labor</b>	
<b>Dependent:</b>	dy/dx	p-value
<b>Child Characteristics</b>		
<i>Age</i>	0.015**	0.048
<i>Gender (Boy)</i>	0.039	0.073
<b>School</b>		
<i>Enrollment</i>	-0.047**	0.042
<i>Distance</i>	0.028***	0.003
<i>Enrollment*Distance</i>	-0.031**	0.045
<b>Household wealth</b>		
	-0.019**	0.032
<b>Farm</b>		
	0.137**	0.044
<b>Household size</b>		
	-0.018	0.073
<b>Edu household head</b>		
	-0.089**	0.031
<b>Religion</b>		
	-0.073	0.059
<b>No. of OBS</b>	1381	

Note: \*\* and \*\*\* indicate statistical significance at 5% and 1% respectively

Table 4

*Logit analysis. Dependent variable is child labor.*

<b>Marginal effects</b>	<b>Farm</b>		<b>Non-Farm</b>	
<b>Dependent:</b>	dy/dx	p-value	dy/dx	p-value
<b>Child labor</b>				
<b>Child Characteristics</b>				
<i>Age</i>	0.053***	0.002	0.037**	0.019
<i>Gender (Boy)</i>	0.182**	0.020	0.070**	0.042
<b>School</b>				
<i>Enrollment</i>	-0.038	0.225	-0.029	0.135
<i>Distance</i>	0.042**	0.047	0.016**	0.05
<i>Enrollment*Distance</i>	-0.017**	0.041	-0.023**	0.036
<b>Household wealth</b>				
<i>Household wealth</i>	-0.021**	0.042	-0.001	0.613
<b>Household size</b>				
<i>Household size</i>	-0.003**	0.05	0.048**	0.03
<b>Edu household head</b>				
<i>Edu household head</i>	-0.124**	0.041	-0.036***	0.000
<b>Religion</b>				
<i>Religion</i>	-0.018**	0.04	-0.052**	0.042

Note: \*\* and \*\*\* indicate statistical significance at 5% and 1% respectively